

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID W. LaFOLLETTE
and JERROLD V. HAUCK

Appeal No. 2002-1135
Application 09/416,497¹

ON BRIEF

Before BARRETT, LEVY, and SAADAT, Administrative Patent Judges.
BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-3, 5-8, 16, and 17. Claim 4 is objected to.

We reverse.

¹ Application for patent filed October 12, 1999, entitled "Early Arbitration on a Full Duplex Bus," which is a continuation of Application 09/018,028, filed February 2, 1998, now U.S. Patent 6,038,234, issued March 14, 2000.

BACKGROUND

The invention relates to a system and method for performing early arbitration on a full duplex bus in order to permit resolution of requests for a next fairness interval during a current fairness interval such that the grant of the highest priority request in the next fairness interval may immediately follow a last packet of a last subaction in a current fairness interval. A fairness interval is a period of time during which a node may transmit a limited number of asynchronous packets. Thus, the bandwidth previously lost by propagating an arbitration reset token and waiting for arbitration requests during an arbitration reset gap can be substantially eliminated.

Claim 1 is reproduced below.²

1. An apparatus comprising:

a state machine that generates a best arbitration request for a current fairness interval or a next fairness interval, wherein the request is encoded with a priority that identifies to which of the current fairness interval and the next fairness interval the requests corresponds;

a transceiver coupled to the state machine; and

a port coupled to the transceiver.

² It is not clear what is meant by "a best arbitration request" in claims 1 and 17 and in the specification, page 4, line 4.

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The examiner relies on the following references:

| | | |
|------------------------|-----------|------------------------|
| Whipple | 4,926,419 | May 15, 1990 |
| Lemay et al. (Lemay) | 5,142,682 | August 25, 1992 |
| Haynie | 5,276,887 | January 4, 1994 |
| Pritty et al. (Pritty) | 5,434,861 | July 18, 1995 |
| Duckwall | 5,802,048 | September 1, 1998 |
| | | (filed August 1, 1996) |

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haynie and Duckwall.

Claims 5-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haynie, Duckwall, and Lemay.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Haynie, Duckwall, and Lemay, further in view of Whipple.

Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haynie, Duckwall, and Pritty.

We refer to the final rejection (Paper No. 7) (pages referred to as "FR__") and the examiner's answer (Paper No. 12) (pages referred to as "EA__") for a statement of the examiner's rejection, and to the brief (Paper No. 11) (pages referred to as "Br__") and reply brief (Paper No. 13) (pages referred to as "RBr__") for a statement of appellants' arguments thereagainst.

OPINION

Claims 1-3

The examiner finds that the abstract of Haynie teaches assigning a priority level to each bus request signal (FR3), but

does not teach an arbitration state machine, ports, and transmit and receive means (FR3-4). The examiner finds Duckwall teaches an arbitration logic state machine for the P1394 bus standard, a transceiver, and a port (FR3-4). The examiner concludes that it would have been obvious "to have modified [the] device disclosed by Haynie by incorporating the teachings of Duckwall, in order to generate an arbitration request encoded with a priority level such as described in application claim 1 herein" (FR4).

Appellants argue that neither Haynie nor Duckwall teaches or suggests creating an arbitration request wherein priority is based on whether a request is for a current fairness interval or a next fairness interval (Br6-7; Br10-11).

The examiner responds (EA9):

On page 7, Appellants argued that cited reference (Haynie) does not teach or suggest "creating an arbitration request wherein priority is based on whether a request is for a current fairness interval **or** a next fairness interval."

As is well understood by those ordinarily skilled in the communication art that a user sends an arbitration request to the central site, the central site assigns the priority for the data to be transmitted in the next fairness interval. This basic structure is fully addressed in the IEEE Standard for a High Performance Serial Bus, IEEE standard 1394-1395 and covered in detail by the Appellant as Related Art.

The cited reference (Haynie) teaches the same concept of receiving a request signal and assigning a priority level for the next period of time during which a node may transmit a limited number of asynchronous packets [*a definition of 'fairness interval' from Newton's Telecom Dictionary*]. An

arbiter determines and stores, in memory, the request signal having highest priority (see Abstract).

Appellants argue that this is a new argument which was not previously discussed in the final rejection (RBr1). It is argued that the combination of Haynie (in light of the 1394 Standard) and Duckwall fails to teach generating arbitration requests for either of a current fairness interval or a next fairness interval as indicated by an encoding in the arbitration request (RBr1). It is argued that Haynie teaches prioritization based on whether devices follow a two-wire protocol or a three-wire protocol, with no teaching of generating arbitration requests for either a current fairness interval or a next fairness interval (RBr1-2). Appellants argue that the 1394 Standard can only generate arbitration requests for a current fairness interval and is unable to generate and accept arbitration requests for a next fairness interval until the next fairness interval begins (RBr2). It is argued that the examiner only relies on Duckwall for the state machine, transceiver, and port and that Duckwall does not cure the deficiencies regarding Haynie (RBr2).

The examiner's statement of the rejection in the final rejection and the examiner's answer is conspicuously lacking in any discussion about the "current fairness interval" and the "next fairness interval." The examiner response to the arguments quoted, supra, asserts that it was known to assign a priority for

data to be transmitted in the next fairness interval, as evidenced by the 1394 standard and Haynie. This does not address the limitation of the "current fairness interval," nor the limitation that "the request is encoded with a priority that identifies to which of the current fairness interval and the next fairness interval the requests corresponds," i.e., a priority between fairness intervals, not a priority within the corresponding fairness interval. If the examiner is relying on a specific claim interpretation for not addressing the "current fairness interval" limitation, such as an "arbitration request for a current fairness interval or a next fairness interval" being an alternative limitation that only requires a request for one of the types of intervals, this should have been expressly stated in the rejection since we cannot read minds (we see the word "or" in bold in the quote, but there is no explanation of why it has been emphasized in connection with appellants' argument). Procedural due process and 35 U.S.C. § 132 of the Patent Statute require that applicants be adequately notified of the reasons for the rejection of claims so that they can decide how to proceed. See In re Ludtke, 441 F.2d 660, 662, 169 USPQ 563, 565 (CCPA 1971).

Nevertheless, assuming that the examiner's rejection is based on an unstated claim interpretation, and assuming that claim 1 is broad enough to read on a state machine generating

only one type of request, for a current fairness interval or for a next fairness interval, this is not the end of the analysis. Claim 1 further recites "wherein the request is encoded with a priority that identifies to which of the current fairness interval and the next fairness interval the requests corresponds," which requires a priority identifying a current fairness interval or a next fairness interval, as distinguished from a priority within the fairness interval (see specification, p. 7, lines 21-25). This priority encoding limitation has not been shown to exist in Haynie or Duckwall.

The examiner does not rely on any portion of Haynie besides from the abstract. The abstract of Haynie discusses prioritization of bus request signals and that an arbiter determines which bus request signal has the highest priority and whether the device follows a two-wire bus arbitration protocol or a three-wire bus arbitration protocol. The examiner apparently relies on the statement that "[t]he expansion bus grants access to the bus to the device having the highest priority once a previous device if any, has relinquished the bus" (abstract). The examiner considers the time period after a previous device has relinquished the bus to be a "next fairness interval."³ This

³ Although the examiner refers to a definition of "fairness interval" from Newton's Telecom Dictionary at EA9, no copy is provided and our version of Newton's, 15th edition, 1999, does not contain an entry for "fairness interval." However, the

does not address the claim language of generating "a best arbitration request for a current fairness interval or a next fairness interval, wherein the request is encoded with a priority that identifies to which of the current fairness interval and the next fairness interval the requests corresponds." The examiner has not shown a request for arbitration during the current fairness interval and a request for arbitration during the next fairness interval. It appears that the requests in Haynie are all requests for arbitration for a current fairness interval, not for a next fairness interval. In any case, there is no "request . . . encoded with a priority that identifies to which of the current fairness interval and the next fairness interval the requests corresponds." The priority in Haynie is strictly a priority of devices within a fairness interval, not a priority between current and next fairness intervals; see specification, p. 7, lines 21-25. A system which only has a priority for devices does not require a priority that indicates one of two different fairness intervals. We find that Haynie does not teach or suggest encoding for current and next fairness intervals.

As to the examiner's reliance on the 1394 Standard, which the examiner states is discussed by appellants, nothing in

definition as a "period of time during which a node may transmit a limited number of asynchronous packets" (EA9) is identical to the definition in the specification (p. 2, lines 25-26).

appellants' description of the 1394 Standard teaches generating arbitration requests encoded with a priority for either a current fairness interval or a next fairness interval, as claimed.

Therefore, we find the combination fails to teach or suggest generating an arbitration request encoded with a priority that identifies whether the request is for a current fairness interval or a next fairness interval. The rejection of claim 1, and its dependent claims 2 and 3, is reversed.

Claims 5-7

The examiner finds that Haynie fails to elaborate on marking the priority requests (FR5). Thus, it appears that the examiner finds that the combination of Haynie and Duckwall does not teach "marking the request as a first priority if the request is for a current fairness interval; and marking the request with a second priority if the request is for the next fairness interval." The examiner finds that Lemay discloses how to mark a request with a highest and lowest priority, and concludes that it would have been obvious to modify the system of Haynie and Duckwall in view of the procedures in Lemay (FR5). It is also stated that Lemay discloses marking the priority for the current or next fairness interval (EA10).

Appellants argue that Haynie and Duckwall both fail to teach or suggest creating an arbitration request wherein priority is

marked as a first priority if the request is for a current fairness interval or as a second priority if the request is for a next fairness interval (Br12). We agree with appellants for the reasons stated in connection with claim 1 and it appears that the examiner also agrees with this statement. It is argued that Lemay fails to cure the deficiencies of Haynie and Duckwall (Br12-13). We agree. Lemay may teach marking a request with a priority, it does not teach that the priority identifies a current or next fairness interval. In addition, the priority being marked is strictly a priority which might be considered within a fairness interval, not a priority between current and next fairness intervals; see specification, p. 7, lines 21-25.

We find that the combination fails to teach or suggest a request for a current or next fairness interval, much less marking the request as having a certain priority based on whether it is for a current or next fairness interval. The rejection of claims 5-7 is reversed.

Claim 8

Claim 8 depends on claim 5 and recites "updating a second priority request to be a first priority request in response to an arbitration reset token." The examiner finds that neither Haynie nor Lemay mentions the recited limitation (FR6-7). The examiner finds that Whipple discloses a priority apparatus in which

priority changes to highest priority every time the position of the node is reset, referring to column 2, lines 50-58 (FR7). The examiner concludes that it would have been obvious to combine the teachings of Haynie and Lemay with the priority change arrangements of Whipple "so that second priority request can be updated to a first priority request in response to an arbitration reset token" (FR7).

Appellant argues Whipple does not cure the deficiencies with respect to parent claim 5 (Br14). We agree with appellants for the reasons stated in connection with claim 1 and, in any case, the examiner does not rely on Lemay for the current and next fairness interval limitations. Since we find that the combination of Haynie, Duckwall, and Lemay fail to teach or suggest marking the request as a first priority if the request is for a current fairness interval and marking the request as a second priority if the request is for a next fairness interval, Whipple would need to teach these limitations in addition to the updating limitations of claim 8, which it does not. A general teaching of updating a priority does not meet the specific limitation of "updating a second priority request to be a first priority request in response to an arbitration reset token." It is also argued that Whipple does not update a priority request in response to an arbitration token as recited in claim 8 (Br14-15).

We agree with this argument. For these reasons, the rejection of claims 5-7 is reversed.

Claims 16 and 17

The examiner finds the circuit to generate an arbitration request encoded with a priority, as recited in claim 17, is discussed in connection with claim 1 (FR7). The examiner relies on Pritty to show multiple nodes coupled by transceivers to a bus organized into a tree topology, having a master polling node capable of generating a master timing signal (FR7-8). The examiner concludes that it would have been obvious to modify Haynie and Duckwall in view of Pritty to institute a tree topology of nodes and the nominal root node receiving arbitration requests encoded with a priority (FR8).

Appellants argue that Haynie and Duckwall both fail to teach or suggest a node which receives arbitration requests for a current fairness interval and a next fairness interval from other nodes in the topology, as recited in claim 16 (Br15). It is argued that Pritty fails to cure the deficiencies of Haynie and Duckwall (Br15). Appellants further argue that Haynie and Duckwall both fail to teach or suggest a circuit to generate an arbitration request that is encoded with a priority that identifies whether the request is for a current fairness interval

or a next fairness interval (Br16). It is argued that Pritty fails to cure the deficiencies of Haynie and Duckwall (Br17).

Claim 16 recites "the node to receive arbitration requests for a current fairness interval and a next fairness interval from other nodes in the topology" (emphasis added). Thus, claim 16 requires receiving two different kinds of requests, one for a current fairness interval and one for a next fairness interval. As discussed in connection with claim 1, Haynie does not teach a request for a current and a next fairness interval, but at best teaches a request for one fairness interval. Claim 17 recites "a best arbitration request that is encoded with a priority that identifies whether the request is for a current fairness interval or a next fairness interval." Thus, claim 17 require requests be encoded with a priority for a current fairness interval and a next fairness interval. As discussed in connection with claim 1, this is not taught by the combination of Haynie and Duckwall. Pritty does not cure the deficiencies of Haynie and Duckwall. For these reasons, the rejection of claims 16 and 17 is reversed.

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CONCLUSION

The rejections of claims 1-3, 5-8, 16, and 17 are reversed.

REVERSED

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| LEE E. BARRETT |) | |
| Administrative Patent Judge |) | |
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| STUART S. LEVY |) | BOARD OF PATENT |
| Administrative Patent Judge |) | APPEALS |
| |) | AND |
| |) | INTERFERENCES |
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| |) | |
| MAHSHID D. SAADAT |) | |
| Administrative Patent Judge |) | |

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THOMAS M. COESTER, ESQ
BLAKELY SOKOLOFF TAYLOR AND ZAFMAN LLP
12400 WILSHIRE BOULEVARD 7TH FLOOR
LOS ANGELES, CA 90025-1026